

# UNCLASSIFIED

FY 2002 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: June 2001

BUDGET ACTIVITY: 3 PROGRAM ELEMENT: 0603729N  
PROGRAM ELEMENT TITLE: Warfighter Protection Advanced Technology

(U) COST: (Dollars in Thousands)

PROJECT

NUMBER & TITLE	FY 2000 ACTUAL	FY 2001 ESTIMATE	FY 2002 ESTIMATE
R2914 Warfighter Protection Advanced Technology	**	**	17,678

\*\*The Science and Technology Program Elements (PEs) were restructured in FY 2002. The work described in FY 2000 and 2001 was funded in PE 0603706N and PE 0603707N.

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program supports the development and demonstration of advanced technologies for improved warfighter protection medical equipment, techniques, technologies and systems. These technologies enhance Navy and Marine Corps capabilities in Casualty Care and Management, Casualty Prevention, and maintenance of a Healthy and Fit Force. The goal of Casualty Care and Management is to maximize the continuum of care with lifesaving interventions as far forward as possible in an increasingly lethal battlespace with reduced infrastructure and logistics. Casualty Prevention includes enhancing warfighter situation awareness and countering threats from disease, battle and non-battle injuries. Healthy and Fit Force efforts preserve health and enhance fitness of ready forces against physical and psychological threats through the continuum of peace and war.

(U) Due to the number of efforts in this PE, the programs described are representative of the work included in this PE.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is budgeted within the ADVANCED TECHNOLOGY DEVELOPMENT Budget Activity because it encompasses design development, simulation, or experimental testing of guidelines and prototype hardware to validate technological feasibility and concept of operations and reduce technological risk prior to operational use or transition to an acquisition program, industry, or clinical trials.

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Advanced Technology

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(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

Casualty Care and Management	FY00	FY01	FY02-\$9,192
Initiate	<ul style="list-style-type: none"> <li>Novel resuscitation fluids: ketone additive</li> <li>Low volume resuscitation fluids: comparison of all FDA-approved hypertonic crystalloids in hemorrhage</li> <li>Low volume resuscitation fluids: evaluation of new FDA-approved low-volume colloid fluid</li> <li>Intranasal ketamine for pain control</li> <li>Ultrasound intra-operative cautery</li> <li>Casualty management coordination system</li> </ul>	<ul style="list-style-type: none"> <li>Hemostatic dressing with microbicidal agent</li> <li>Pelvic clamp for hemostasis</li> </ul>	<ul style="list-style-type: none"> <li>Portable injectable water system: man-carried system</li> <li>High intensity focused ultrasound technology for hemorrhage location and hemostasis</li> <li>Hand-held portable ultrasound diagnostic imager evaluation in trauma</li> <li>Novel analgesics to reduce pain</li> </ul>
Continue	<ul style="list-style-type: none"> <li>Novel oxygen carrying blood substitutes: pegylated liposome-encapsulated synthetic hemoglobin; freeze-dried red cells</li> <li>Portable injectable water shipboard system</li> <li>Novel resuscitation fluids: gas diffusion enhancer</li> <li>Freeze-dried platelets</li> <li>Hollow-fiber frozen red cell glycerolization/deglycerolization system (demo)</li> <li>FDA-approval algal polymer</li> </ul>	<ul style="list-style-type: none"> <li>Novel resuscitation fluids: ketone additive</li> <li>Low volume resuscitation fluids: comparison of all FDA-approved hypertonic crystalloids in hemorrhage</li> <li>Low volume resuscitation fluids: evaluation of new FDA-approved low-volume colloid fluid</li> <li>Intranasal ketamine for pain control</li> <li>Ultrasound intra-operative cautery</li> </ul>	<ul style="list-style-type: none"> <li>Novel resuscitation fluids: ketone additive</li> <li>Low volume resuscitation fluids: comparison of all FDA-approved hypertonic crystalloids in hemorrhage</li> <li>Low volume resuscitation fluids: evaluation of new FDA-approved low-volume colloid fluid</li> <li>Intranasal ketamine for pain control</li> <li>Casualty management coordination system</li> <li>Novel oxygen carrying blood</li> </ul>

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	hemostatic field dressing	<ul style="list-style-type: none"> <li>Casualty management coordination system</li> <li>Novel oxygen carrying blood hsubstitutes: pegylated liposome-encapsulated synthetic hemoglobin; freeze-dried red cells</li> <li>Portable injectable water shipboard system</li> <li>Novel resuscitation fluids: gas diffusion</li> <li>Hollow-fiber frozen red cell glycerolization/deglycerolization system enhancement</li> </ul>	<p>substitutes: pegylated liposome-encapsulated synthetic hemoglobin; freeze-dried red cells</p> <ul style="list-style-type: none"> <li>Hemostatic dressing with microbicidal agent</li> <li>Pelvic clamp for hemostasis</li> <li>Low-volume resuscitation fluids: gas diffusion enhancer</li> </ul>
Complete	<ul style="list-style-type: none"> <li>Extended shelf-life liquid red cells</li> <li>FDA approval for algal polymer hemostatic field dressing</li> <li>Hand-held portable ultrasound diagnostic imager (transition)</li> </ul>	<ul style="list-style-type: none"> <li>Freeze-dried platelets (move to Army funding)</li> <li>FDA-approved algal polymer hemostatic field dressing (transition)</li> </ul>	<ul style="list-style-type: none"> <li>Ultrasound intra-operative cautery - demonstration</li> <li>Portable injectable water shipboard system - transition</li> <li>Hollow-fiber frozen red cell glycerolization/deglycerolization system (transition)</li> </ul>

Casualty Prevention	FY00	FY01	FY02-\$7,955
Initiate	<ul style="list-style-type: none"> <li>Assess pharmacological interventions for decompression sickness/oxygen toxicity</li> </ul>	<ul style="list-style-type: none"> <li>Body armor biodynamics</li> <li>Evaluate laser technology and laser injury impact on operational performance</li> <li>Assess Gz-tolerance in repeated high/Gz conditions</li> <li>Investigate impact of thermal stress on operational performance</li> <li>Enhanced maintenance of spatial</li> </ul>	<ul style="list-style-type: none"> <li>Agile laser eye protection</li> <li>Helicopter Aircrew Integrated Life Support systems</li> <li>Advanced multi-purpose diving system</li> <li>Salivary tests for disease diagnosis</li> <li>Advanced personal environmental control system</li> </ul>

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		orientation • Smart uniform with embedded physiological sensors	
Continue	<ul style="list-style-type: none"> <li>• Laser event recorder</li> <li>• Guidelines for low frequency acoustic effects on human divers</li> <li>• Develop criteria to evaluate new-technology-sensor-based devices</li> <li>• Validate new methods for neurotoxicant testing</li> <li>• Validate radiofrequency (RF) induced current model in shipboard environment</li> </ul>	<ul style="list-style-type: none"> <li>• Laser event recorder</li> </ul>	<ul style="list-style-type: none"> <li>• Body armor biodynamics</li> <li>• Evaluate laser technology and laser injury impact on operational performance</li> <li>• Assess Gz-tolerance in repeated high/Gz conditions</li> <li>• Investigate impact of thermal stress on operational performance</li> <li>• Enhanced maintenance of spatial orientation</li> <li>• Smart uniform with embedded physiological sensors</li> </ul>
Complete	<ul style="list-style-type: none"> <li>• Model for early stages of smoke inhalation injury</li> </ul>	<ul style="list-style-type: none"> <li>• Assess pharmacological interventions for decompression sickness/oxygen toxicity</li> <li>• Guidelines for low frequency acoustic effects on human divers (transition)</li> <li>• Develop criteria to evaluate new-technology-sensor-based devices</li> <li>• Validate new methods for neurotoxicant testing</li> <li>• Validate RF induced current model in shipboard environment</li> </ul>	<ul style="list-style-type: none"> <li>• Laser event recorder (demonstration)</li> </ul>

Healthy and Fit Force	FY00	FY01	FY02-\$531
Initiate	<ul style="list-style-type: none"> <li>• Investigate the application of acoustic technology for</li> </ul>	<ul style="list-style-type: none"> <li>• Assessment and prevention of noise-induced hearing loss</li> </ul>	<ul style="list-style-type: none"> <li>• Anthropometry for human factors in cockpit design</li> </ul>

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	<ul style="list-style-type: none"> <li>hearing protection</li> <li>Assess vibration characteristics and resonance frequencies in waterborne low frequency sound</li> </ul>	using antioxidants	<ul style="list-style-type: none"> <li>Injury prevention/fitness optimization</li> </ul>
Continue	<ul style="list-style-type: none"> <li>Tuned materials for hearing protection</li> <li>Occupational fitness for injury reduction</li> </ul>	<ul style="list-style-type: none"> <li>Assess vibration characteristics and resonance frequencies in waterborne low frequency sound</li> <li>Tuned materials for hearing protection</li> <li>Occupational fitness for injury reduction</li> </ul>	<ul style="list-style-type: none"> <li>Assessment and prevention of noise-induced hearing loss using antioxidants</li> <li>Occupational fitness for injury reduction</li> </ul>
Complete	<ul style="list-style-type: none"> <li>Evaluate neck and back strain in E2C aviators</li> <li>Develop standards for use of photorefractive keratectomy (PRK) procedures on aviators</li> </ul>	<ul style="list-style-type: none"> <li>Investigate the application of acoustic technology for hearing protection</li> </ul>	<ul style="list-style-type: none"> <li>Tuned materials for hearing protection (demonstration)</li> </ul>

## (U) PROGRAM CHANGE SUMMARY:

	FY 2000	FY 2001	FY 2002
FY 2001 President's Budget			0
Appropriated Value			
Adjustments from FY 2001 President's Budget			
PE Restructure			17,700
NWCF Rate Adjustment			-3
Non-Pay Inflation			+3
Minor Adjustments			-22
FY 2002 President's Budget Submission	**	**	17,678

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(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: Not Applicable.  
(U) Schedule: Not Applicable.

(U) OTHER PROGRAM FUNDING SUMMARY:

(U) NAVY RELATED RDT&E:

(U) PE 0602235N Common Picture Applied Research  
(U) PE 0602236N Warfighter Sustainment Applied Research  
(U) PE 0603236N Warfighter Sustainment Advanced Technology  
(U) PE 0604771N Medical Development

(U) NON-NAVY RELATED RDT&E:

(U) PE 0602716A Human Factors Engineering Technology  
(U) PE 0602785A Manpower, Personnel and Training Technology  
(U) PE 0602787A Medical Technology  
(U) PE 0603002A Medical Advanced Technology  
(U) PE 0602202F Human Effectiveness Applied Research  
(U) PE 0603231F Crew Systems and Personnel Protection Technology

(U) SCHEDULE PROFILE: Not applicable.

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